ABRASIVE BLASTING SAFE WORK PROCEDURES

1.0 PURPOSE

1.1 The purpose of this section is to provide minimum requirements for the proper safe work practices for abrasive blast operations.

1.2 If these guidelines conflict with any local, provincial, state, federal or other governmental stature or regulation, the more stringent guideline will apply.

1.3 It shall be the responsibility of all users to avail themselves to, and comply with, all applicable codes, regulations, standards, and common sense practices designed to ensure safe abrasive blast operations.

2.0 SCOPE

BRAND adopted these procedures as a minimal guideline for safe operation of the Schmidt auto blaster, Clemtex Auto blaster and Marco blasting equipment (nozzle, air hose, blast hose, etc). These procedures do not address specific operating procedures for bulk blasting units of a different model or design. Alterations to the Auto blasters may cause a change in the way the system operates and shall be taken into consideration during unit inspection.

3.0 DEFINITIONS

a) **Bulk-Blaster**

Also referred to as the Auto-Blaster, is a mobile self-contained abrasive-blasting unit that utilizes “Bulk” abrasive and is typically filled utilizing an overhead Abrasive Hopper and/or Bulk Bag abrasive.

b) **Abrasive**

Media used in abrasive blasting. There are many different types of abrasive media and each has its own abrasive properties. Some media is less abrasive than others.

c) **Pinch Valve**

Also referred to as the Guillotine Valve, this air-operated valve is designed to shut-off air and abrasive flowing into the blast hose when the dead-man switch has been released. Shut-off occurs when the valve pinches the blast hose and stops flow. This is a Fail-Open valve/Normally Open valve, also notes that this equipment is typically used as part of a “System” and is used in conjunction with a “Clemco” Style Abrasive metering valve commonly referred to as a “Pancake” or “Abrasive” valve. Also, note that these are not required when Abrasive Blast equipment utilizes “Thompson Type Valve control systems”. Pinch valves shall all be phased out in favor of Thompson Type Valve control systems.

d) **Thompson Type Valve Control Systems**

The Thompson Type Valve control system is a Fail-Closed/Normally closed control System. This systems incorporates an in line automatic air valve that shuts the air flow off and a Thompson Type abrasive metering valve that shuts the abrasive off when the dead man is released. Both valves are normally closed and fail in the closed position.

e) **Choke Valve**

The manual ball valve located in line before the abrasive metering valves.

f) **Abrasive Metering Valve**

The manual valve, which controls abrasive-feed from the abrasive-pot into the blast hose.

g) **Dead-Man**

A remote control switch that is designed to shut-off air/abrasive flowing from the blasting unit, at the nozzle. This occurs when the blaster releases the dead-man switch. Pneumatic as well as Electrical models are available. The preferred standard for Brand equipment is Electrical Dead man Controls. Dead-Man controls require constant hand pressure to be engaged in the "On" position.

h) **Solenoid**

The 12 Volt DC electrically operated coil that closes/opens a valve feeding supply-air to the Thompson Valve or Pinch Valve. This switch operates in conjunction with the dead-man switch being engaged or disengaged.

i) **Solenoid Control Valve**

The valve, which is operated by the electrical solenoid when the dead-man is engaged or disengaged.

j) **Manual Blow-down Valve**

The manual ball valve used to depressurize the vessel.

k) **10" Closure Assembly**

10" Cam Lock Closure assembly used to fill the bulk pot with blast Abrasive.

l) **Man-Way Crab Assembly**

Man-way located on side of the unit, which is used for internal inspection and maintenance.

m) **Bull Hose**

The main air supply hose coming from the compressor and feeding air to the Bulk-Blaster.

n) **Blast Hose**

The hose used to deliver high-pressure air and abrasive from the bulk-blaster to the blast nozzle.

o) **Blast Nozzle**

The device used to control the delivery of a blast agent under high pressure and high velocity onto the surface being blasted.

p) **Blaster**

The person operating the blast nozzle during blast operations.

q) **Stand-By Operator**

The person who operates the bulk blaster during blast operations and who acts as a safety stand-by for required emergency shutdown.

r) **Operator**

Any employee who is operating any of the blast equipment, including, but not limited to air compressor, bulk pot, blast nozzle, hose installation/ repair, etc).

s) **Hose/Whip Check**

A cable device used to attach hoses to equipment and hoses to other hoses. Purpose is to prevent pressurized hoses from becoming disengaged from its point of attachment and injuring personnel or damaging equipment.

t) **Grounding**

The process of dissipating static electricity that may be created during operations on process equipment with potentially flammable contents or areas with potentially flammable atmospheres.

u) **Pressure Relief Valve**

A valve used to control or limit the pressure in a system or vessel which can build up by a process upset, instrument or equipment failure.

v) **Pressure Indicating Ball Valve**

A ball valve located on the top head of the vessel by the 10" closure used to determine if the pressure has been bled off of the vessel.

w) **Pneumatic Cam Lock Closure Device/ HALOK**

A Lock Out/Tag Out safety device installed around the 10" closure to prevent accidental opening of a closure under pressure and to insure operator competency.

x) **Bulk Bag Rack**

A rack mounted on top of the bulk unit to accommodate the use of bulk bag material that supports the bulk bag load as opposed to working under a suspended load.

y) **Blow Down Muffler**

A muffler system installed on the blow down designed to lower the noise levels

4.0 GENERAL SAFETY

4.1 All employees involved in the blasting operations shall be qualified to perform the duties he/she will be performing; via the required training, inspection, and verification documents included in this Safety Procedure Document. Before blast operations are set-up, a thorough review of the job-site hazards shall be performed

4.2 Operators shall identify hazards and take appropriate control action for:

Mechanical/Structural integrity of items (substrates) to be abrasive blasted must be reasonably assured via a visual inspection by Supervision and the Workers. Also, whenever feasible, additional inspection techniques shall be employed and include owner personnel whenever possible. (See attached IDLH / Inspection Form)

a) Any process equipment such as tanks, vessels, pumps/motors, piping etc. shall be identified and a determination made of the chemical, thermal and pressure properties of each via an SDS and Operations review. From this review, Site, Division and/or Area Safety will assess what additional PPE, Emergency Response Planning, Training, Equipment, or Engineering Controls may be required in addition to our normal procedures for Abrasive Blasting.

b) During the Pre-Job Safety Planning process for a specific work area, care shall be taken to identify potentially hazardous items. Lead, chromium, arsenic or other hazardous content of coating must be determined via chip sample analyzed by an accredited laboratory in compliance with our Lead Policy and documented results must be included with the Job Safety Plan. No work may proceed without this documentation, unless assuming full lead mode.

c) Equipment which is energized, or operating, which could be affected by one or more phases of work activity in the area for example Ball Valves, Control Valves, Magnetic Valves, Sample Areas, Instruments, Motorized Equipment, Rotating Equipment and any other delicate equipment. Appropriate measures shall be taken to prevent ingress of abrasive to equipment, over-blasting, accidental operation of valves or equipment, care to protect electrical control wiring to equipment. Thought shall be given to all phases of work and how it impacts these potentially dangerous items during operations, ingress, egress, rigging of hoses, trapping, etc.

4.3 All personnel involved in the job must have a clear and precise understanding of exactly what is and is not to be abrasive blasted and what could potentially be affected by our operations to include mobilization/demobilization, rigging, abrasive blasting, etc. Client/facility abrasive blasting requirements shall be identified and taken into account when planning a job. Items to consider would include, but not limited to:

a) The mechanical/structural integrity inspection process as mentioned above and the documentation by all parties involved in the process (reference IDLH/Inspection Form). This process is critical where potential for chemical, thermal, or high pressures could potentially be exposed or occurs. Areas that exhibit these qualities are Process Units, Vessels, Tanks, Terminals, and Pipeline Operations.

b) Permit Requirements - Items such as JSP, IDLH/Inspection Form, Safe Work Permit, Hot Work Permit, Confined Space Permit as well as any other Site Specific Permits (i.e. Some Clients require a specific permit for abrasive blasting). Any specific barricading, signs, cover or protection requirements.

c) Personnel requirements, pot tenders (pot watches) must be utilized during any autoblaster or six sack pot operations. Supervision, safety, fire-watch may or may not be specifically required. Verify the actual requirements for each of these as well as potentially others.

d) Specific reporting requirements for particulate matter, which will be generated during our operations (EPA, State, Local, BRAND Emissions Management Process, and any other applicable governing body for a specific project site such as the Coast Guard)

e) What impact will our operations have on the public, owner personnel, other contractors or owner vendors and what notifications or reporting will be required of BRAND to these groups.

f) Equipment specifications, types, sizes, inspection requirements, repairs, additional components to be used in conjunction with our equipment, special safety and/or alarm systems, and Remote Control (Dead Man, solenoids, remote lines). Integrity and compatibility of these items are the responsibility of the Division/Region Equipment/Resource Manager.

g) Abrasive specifications for the facility or client, by generic type (slag, metallic etc., silica sand will not be used as abrasive media) specific brands if applicable, size of abrasive, packaging requirements such as size or labeling information. Sufficient exposure monitoring will be performed to ensure personnel are not exceeding Permissible Exposure Limits as per Brand Industrial Hygiene Policy.

- Specific Engineering Controls Required
- Containment
- Wet Abrasive Blasting
- Others

4.4 Only equipment approved by Brand shall be used for blast operations. At a minimum this equipment shall be mechanically complete, have appropriate BRAND Equipment Number, Have all appropriate Operations Signs and Warnings posted on the pressure vessel, have a legible and satisfactory ASME tag in place and be able to satisfactorily pass the inspection process included in this document.

4.5 Do not operate this equipment without a pressure relief device installed to protect the blaster vessel from over-pressurization. The ASME code requires that all vessels be operated with pressure relief device in place. This device must be sized properly and rated based on the ASME code tag on the vessel.

4.6 Install pressure gauge at the inlet of the moisture separator

4.7 No equipment shall be modified from its original design, unless approved by the Area, Division or Site Manager or their designee(s) (blast hose repairs are excluded from this requirement).

4.8 Blast hose shall be repaired or altered only by approved recommended practices. This can only be done with the approval of the job Supervisor. See approved practice for normal duty blast hose repairs in the appendix of this document.

4.9 The system shall only be operated or serviced by persons authorized and qualified to do so. The JSP shall specifically address the roles of employees and the abrasive blasting equipment on the project. Supervisors shall verify proper training has occurred for employees involved.

4.10 No service shall be performed on the bulk blaster until all hazardous energy has been eliminated.

4.11 Any time the system blow-down valve is closed, it shall be assumed the system is under pressure.

4.12 Lug Nuts shall be tightened periodically (minimum quarterly) on used units. On new units, it is recommended that lug nuts be tightened more frequently until seated.

4.13 Care shall be taken not to exert side loads on the wheels, especially when loaded.

4.14 Under no circumstances shall bulk blast systems be modified or welded on, unless by a qualified and authorized person.

4.15 Repairs to any pressure vessel must be made in accordance with the applicable regulatory requirements, including, but not limited to (ASME Code Section VII, Div. 1). In general, a repair shop holding a National “R” Stamp and/or ASME “U” Stamp, depending on state or city laws.

4.16 If during the SDS and/or Operations review it is determined that either the in-service process equipment we are performing abrasive blasting on or the atmosphere we potentially will be working in is potentially flammable, then our operations must comply with the Site or Brand "Grounding" procedures. Refer to Section 15.1 of this section.

4.17 Anytime Abrasive Blasting Equipment is utilized which is not specifically included as one of the covered Makes/Models of this procedure, contact the Region Equipment/Resource Manager prior to operation.

4.18 Always assume dead man switch is live, with the potential for abrasive media under pressure to be released if switch is activated. When moving or re-positioning hoses, ensure the dead man switch will not be activated until such time the nozzle is under control and directed at the work surface. It is strictly forbidden to splice deadman lines. Splicing deadman lines can create a situation where a short can easily develop, causing the blast nozzle to actuate. Instead of splicing, plugs should be installed. Deadman must be connected to blast hose in close proximity to the nozzle. Remote operation of dead man is strictly forbidden.

NEVER DIRECT NOZZLE AT SELF OR OTHERS.

4.19 When utilizing auto-blast equipment that can accommodate multiple blasters, working simultaneously, blast hoses, deadman switches, deadman lines and solenoid connections must be color-coded or numbered to prevent crossing dead man lines and hoses To ensure proper connection prior to pressurizing auto-blast equipment is by testing the deadman to ensure it is actuating the correct solenoid. When the deadman is actuated, you will hear a click from the solenoid confirming proper connection. DO NOT PERFORM THIS TEST WITH THE AUTO-BLAST EQUIPMENT PRESSURIZED.

5.0 PERSONAL PROTECTIVE EQUIPMENT

5.1 Operators will be equipped with blasting gloves and Leather or Heavy Canvas protective sleeves will be worn. Some areas such as Caustic or Acid areas, acid suits with heavy rubber gloves will need to be worn. In congested areas a blast suit will be worn. Safety shoes with a defined heel shall also be worn.

5.2 Eye, face and respiratory protection shall be supplied to all personnel working within the barricaded, controlled area or enclosure. Blasting hoods with continuous flow supplied air will be worn by all personnel performing dry or wet blasting operations. Personnel sweeping dry grit or cleaning up dry grit shall at a minimum wear half face respirators.

Precautions shall be taken to protect personnel in the blasting zone including the blasting operator from excessive noise exposure by supplying earplugs and/or muffs.

Vortex tubes, which cool the air supply to the blasters hood, shall be considered depending on season and exposure of the employee to heat sources.

6.0 HOUSEKEEPING AND SANITATION

6.1 Good housekeeping practices shall be followed in abrasive blasting operation to prevent slips, trips and falls. Facility shall be available for blasters to wash before eating and after blasting operations.

ABRASIVE BLASTING SAFE WORK PROCEDURES

7.0 ADMINISTRATIVE DUST CONTROL METHODS

7.1 Isolation. Most of the blasting as possible shall be done in a specified location. A blasting zone (where dust is visible) shall be established and marked off with signs around the perimeter of the area such as:

- Caution
- Abrasive Blasting Area
- Authorized Personnel Only
- Eye, Ear, and Respiratory Protection
- Required in this area

7.2 Blasting shall not be done when wind direction and velocity carry visible dust to people unprotected by appropriate PPE if visible dust is present, temporary enclosures shall be used. Where possible, objects or structures shall be fully enclosed. When full enclosure is not possible, extend screening above the object or structure, and blast downwards. Air monitoring shall be used to ensure that employees outside the enclosure are not exposed to elevated levels of air contaminants (See Respiratory Procedure). If high levels of air contaminants are detected outside the enclosure; (1) employees shall be excluded from these areas through the use of warnings signs and barricades or provided with appropriate PPE and (2) better control measures shall be investigated and implemented.

7.3 Enclosure

Blasting of small objects shall be done in an enclosure, which is designed to specifically reduce the dust hazards.

8.0 8.0 RESPIRATORY PROTECTION

8.1 All persons blasting shall use NIOSH/MSA approved Class "C" air supplied respirators with hood with apron and dust collar, properly fitted and properly worn.

8.2 Half mask respirators with HEPA filters (P-100 particulate filters) may be used for short, intermittent, or occasional dust exposure, including clean-up, dumping of dust collectors, unloading shipments of abrasive at a receiving point, when it is not feasible to control the dust by enclosure, exhaust ventilation, or other means. Respirators used shall be certified for protection against the specific type of dust. Respirator users must be medically qualified, trained, and fit tested for the specific respirator before use.

8.3 Maintenance - Equipment

a) Blast Hood Respirators must be cleaned daily. This can be accomplished by use of vacuum or water.

b) Respirators must be kept in maximum operating condition at all times.

c) After their daily cleaning, respirators must be properly stored (filters bagged separately from respirator) outside the blast area.

d) After their daily cleaning, blast hoods must be kept and hung in an upright position outside the blasting area to prevent abrasive from spilling inside or stored in a clean dry location.

e) Hood skirts, and Blast suits shall be cleaned or laundered as needed per manufacture's recommendation.

8.4 Air Supply and Air Compressors for Abrasive-Blasting Hoods

a) Air supply (Grade "D" minimum) shall be free of harmful quantities of dust, mists or noxious gases.

b) The air from the regular compressed air line of a compressor unit may be used for the abrasive blasting hood if:

1. A seven stage filtration system (trap and carbon filter) is installed that will remove oil, water, particulates and odor and is regularly maintained. Filters shall be inspected monthly and colored tape attached in accordance with inspection procedure. A record of the maintenance of these filters shall be kept.
2. A pressure-reducing regulator is installed to reduce the pressure to requirements of the particular type of abrasive blasting respirator.
3. An automatic control is provided to either sound an alarm or shut down the compressor in case of overheating.
4. Only screw or rotary compressors are permitted for supplying breathing air.
5. Continuous monitoring via inline air monitor must be done to ensure no contamination by Carbon Monoxide. CO monitor will be inspected daily and calibrated according to scheduled maintenance.

9.0 PRE-JOB SET-UP

9.1 All employees involved with the blast operations shall conduct a Job Safety Plan (JSP) prior to beginning work. (See Brand EHS Manual EHS #3.0)

9.2 In addition to the JSP, the Abrasive Blasting Pre-Job Checklist (Form A) shall be completed before work begins.

9.3 Before any systems are initially energized, they shall be thoroughly inspected for safe operations. Inspections shall be documented by using the appropriate checklist forms (Bulk Blaster Daily Inspection form (Form A) and the Hose Inspection from (Form F from Section #19).

9.4 All applicable client/facility permits shall be obtained prior to work beginning.

9.5 If any unexpected hazard(s) are found, work shall be shutdown and the JSP must be modified to include the new hazard(s). All employees must be made aware of the new hazards(s) found and the corrective action required.

9.6 If any pressurized system fails unexpectedly, the job shall be shutdown and the pre-job checklist shall be performed again.

9.7 The supervisor of the job must review the equipment inspection forms and approve the pre-job

10.0 INSPECTIONS

10.1 Pre-Job Inspections

a) Pre-Job inspections shall be conducted in accordance with section III of this procedure. Alterations to Autoblaster may cause a change in the way the system operates and shall be taken into consideration during unit inspection.

10.2 Continuous Inspections

a) The stand-by operator shall conduct a continuous visual inspection for visual equipment defects. This visual inspection shall include all equipment from the air source to the blast hose.

b) The blast operator shall continuously monitor the blast nozzle output and dead-man functions for safe operation.

10.3 Shift Inspections

a) At the beginning of each shift, or anytime the bulk blaster has been moved, all blast hose and air hose shall be inspected using the Daily Bulk Blaster - Auto Blaster Inspection Form.

b) At the beginning of each shift, the bulk blaster shall be inspected using the Daily Bulk Blaster - Auto Blaster Inspection Form (See Form A, Bulk Blaster Daily Inspection Form).

11.0 OPERATING PROCEDURES AND TROUBLESHOOTING

11.1 The bulk blaster shall be operated in accordance with the manufacturers recommended instructions (See Appendix A, Bulk Blaster Operating and Maintenance Instructions).

11.2 To reduce waste and properly select equipment, it is recommended using the manufacturer Blast Data information to operate the system (See Appendix D, Blast Data Reference Chart).

11.3 While blasting inside a Confined Space, tank or vessel, where powered work platforms are being used, a high visibility demarcation stripe shall be painted on the interior of the tank at the height of the top handrail of the powered work platform being used, i.e., ‘Spider’ basket or other manufacturer’s basket being used. This stripe will be utilized to warn the operator that the basket is indeed on the surface of the floor of the tank or vessel, and it is safe to exit the basket.

11.4 While abrasive blasting inside a confined space, tanks or vessels, where powered work platforms are being used, and a high visibility demarcation stripe has been painted, abrasive blasting operations will begin at the top of the tank and blasting will be performed toward the bottom of the tank to protect the demarcation line so the blaster is warned of the proximity of the floor of the tank or vessel.

11.5 The stand-by-operator (blast pot watch) will maintain visual checks of each abrasive blaster’s hose and will, after one minute of blasting inactivity, initiate a physical check of each blaster’s well-being by shutting down all blasting activities and contacting the Confined Space Attendant and advising him of the need to check on the confined space entrants, or checking on the blasters outside of a confined space himself as the situation warrants.

11.6 At the foreman’s discretion, based on the atmospheric conditions inside the Confined Space, prior to moving any equipment, i.e., aerial manlifts, powered work platforms (Spider) inside of a tank or vessel, during abrasive blasting operations, abrasive blast hoses will be shut down and all personnel affected will be advised of the equipment about to be moved. The Confined Space Attendant will be notified of all movement of equipment inside the Confined Space.

ABRASIVE BLASTING SAFE WORK PROCEDURES

12.0 MAINTENANCE AND REPAIRS

12.1 General Maintenance

a) A qualified person must perform maintenance.

b) Maintenance must be performed in accordance with the manufacture specifications (See Appendix A, Operating and Maintenance Instructions).

c) Maintenance to the pressure vessel must be performed in accordance with all applicable regulations, including, but not limited to ASME Code Section III, Div. 1.

d) Under no circumstance shall alterations be made to the equipment that will reduce the safe operation or mechanical integrity of the unit.

12.2 Quarterly Maintenance

a) Valves associated with the bulk blaster shall be inspected, operated and lubricated.

b) Gaskets on the Man-way(s) shall be inspected.

c) Safety switches and controls (dead-man, solenoid, etc) shall be tested and inspected.

d) Electrical and/or pneumatic controls shall be tested and inspected.

e) The interior condition of the Bulk Blaster vessel shall be visually inspected.

12.3 Maintenance/Testing

a) Pressure vessels shall be hydro tested according to best practices based on the design pressure stamped on the vessel. Vessels with ½" shell thickness shall be hydro tested every 5 years. Vessels with shell thickness less than ½" will be tested every 3 years.

b) The vessel will be thoroughly inspected for any additional defects and appropriate repairs will be made before returning the equipment to service.

c) Hoses to be inspected and repaired per 4.8.

d) Pneumatic or Electrical Systems to include, piping, valves, remotes/dead man, and dead man control line are only to be repaired by designated personnel. Field repairs of any systems on this equipment by non-approved personnel is strictly prohibited.

e) Inspection of Safety Relief Valves to be done daily.

12.4 Mechanical Integrity and Preventive Maintenance Procedures:

a) Mechanical integrity inspections/testing will be scheduled and conducted. Inspections/testing will be conducted in accordance with ASME Code VIII, Sec.1 and any other state or city requirements.

b) Procedures establishing preventive maintenance programs will be maintained and updated, as required by the Region Equipment/Resource Manager or their designee(s).

c) Copies of the preventive maintenance records can be obtained from the Region Equipment/Resource Manager or their designee(s).

ABRASIVE BLASTING SAFE WORK PROCEDURES

13.0 QUALIFICATIONS AND TRAINING

13.1 Personnel Operating Abrasive blast equipment must complete the minimum required operator qualifications described in this procedure.

13.2 Operators shall successfully complete the following criteria before being assigned to perform operator duties,

13.3 Must review the Bulk Blaster Safety Procedure.

13.4 Score 80% on the Abrasive blasting Safety Exam.

13.5 Review with a qualified trainer/supervisor any missed questions.

13.6 Must demonstrate hands-on ability to set-up bulk blaster troubleshoot systems and safely shutdown system, (see Operator Pre-Qualification Evaluation – Form B).

13.7 Be issued a Bulk Blaster Operators Card.

13.8 Exception to paragraph 13.0, b), Unqualified Personnel may operate the bulk blaster unit for purposes of training and/or evaluation. This shall ONLY be done under the direct supervision of a qualified trainer/supervisor. Under no circumstance shall a qualified trainer/supervisor allow a nonqualified employee to operate the bulk blaster without he/her being present.

13.9 Personnel designated to train/qualify personnel must meet the following criteria.

13.10 Must be authorized by the project manager or Division manager of Brand.

13.11 Must be competent in the operation, maintenance, troubleshooting techniques, and general practices for the equipment being used.

13.12 Must have reviewed this procedure and any manufacturer's procedures for the equipment being used.

13.13 Must have successfully passed (90%) the Train the Trainer exam for this procedure (see Train the Trainer Exam, Form D).

14.0 ABRASIVE BLASTING SAFE WORK PRACTICES FOR IN-SERVICE TANKS

14.1 Product Movements

1. The client's Operations Department will be informed of all scheduling; If possible, blasting operations shall be scheduled while the tank is in a static state.
2. The Operations Department will make the Contractor aware at all times of the responsible person for obtaining work permits and keeping tank "Block Out" during Abrasive Blasting and painting operations.
3. Product movement into the tank will not be allowed during the Abrasive Blasting or spray painting operations. Brush and roll painting will be allowed on the external shell wall only during movement out of the tank. Continuous atmospheric monitoring will be required during painting while there is product movement from the tank.

4. Product movement out of the tank will limit the blasting operations. The Abrasive blasting will be allowed to continue provided the blast area is maintained 3 foot below the product line in the tank being blasted. This will not allow for the vapor space inside the tank to be heated by the blasting operations on the exterior shell.
5. Floating roof tanks shall have the roof position at the maximum filling height prior to commencing the Abrasive Blasting. There will be no blasting or painting activities allowed on the roof of a floating roof tank while product is being moved in or out of the tank.
6. Inform Contractor Personnel of information concerning the operation of tanks, vapor, and pressure relief system.

15.0 WORK PROCEDURE

15.1 Grounding Connections

1. Abrasive Blasting Equipment
   a) The pot will be equipped with a grounding rod of sufficient length and connected to the abrasive pot by means of No. 6 copper wire or to a client provided ground. Many clients will not allow contractors to install a grounding rod, these clients must supply a sufficient ground for blasting operations to proceed and proper permit to install ground rod.
   b) The Abrasive Blasting nozzle will also be connected to the Abrasive Blasting pot by means of a copper wire and the complete system will have a sufficient bolted connection to form an acceptable ground. All bolted connections will be maintained in a tight condition.
   c) Tank to be Abrasive blasted will be grounded to same grounding rod or client provided ground, as the abrasive pot.
   d) Floating roof tank stairs will be appropriately grounded to the roof by means of bolted connections.
   e) Grounding system will be checked prior to any start, restart of Abrasive Blasting operations by means of an ohmmeter. Reading must to be one ohm or less. The readings need to be recorded in morning and afternoon.
2. Spray Equipment
   a) Spray equipment and tank will be grounded to a common grounding rod or client provided ground, by means of bolted connections.

15.2 Venting

1. Cone Roof Tanks
   a) Cone roof tanks will have openings sealed only in the affected area. Open vent(s) will have a ten foot extension added with an appropriate rain head or filter media used to cover the vent. The sealing of all vents is strictly prohibited to avoid possible catastrophic events.
2. Floating Roof Tanks

a) All roof venting will be closed or sealed in the affected area only, at least one vent must be open to ensure integrity of equipment if product is moved in or out of equipment accidentally.

b) Check seal area for proper fitting.

3. Fire Protection Equipment

a) Sufficient fire extinguishers will be readily accessible for both tank roof and painting operations.

b) Owner will insure that tank fire and / or deluge protection system is in proper operation condition.

15.3 Owner Responsibilities

1. Provide permits and permit procedures, unless “Self-Permitting” has been approved (if self permitting has been approved, refer to Brand Work Permitting Procedure).
2. Monitor for flammable or toxic vapors.
3. Insure proper valve blocking and isolation prior to commencing work and continued throughout all surface preparation and painting work.
4. To notify Brand of any and all safety and operational changes that affects the work procedures. Note: The procedures for Abrasive Blasting pipe racks are the same as in-service tanks including grounding and detection of metal loss, toxic condition, etc.

16.0 SETTING-UP PROCEDURE FOR SAND HOPPERS (SIZE: 8 FEET X20 FEET)

16.1 Setting a sand hopper is a very important task. Brand must assure that all hoppers are set on suitable foundation and conditions do not change at any time during the course of the job. Having a suitable foundation is important and applying adequate matting will distribute the weight of the sand hopper throughout a larger area than without adequate matting.

a) Brand Supervisor shall contact Customer Contact to obtain historical data on the ground condition.

b) Brand will not set – up any sand hoppers inside of any tank farm or any areas without applying suitable foundation.

c) Brand will only set sand hopper without mats if the ground material is made of concrete/asphalt with the approval by the local Safety Manager and the Customer Contact.

d) Before any cables are applied to a sand hopper Brand. Field Supervisor will check the level of the hopper with a suitable level on all four sides.

Sand hopper level will be checked frequently and after any rain or any conditions that could cause the ground under the foundation to become saturated with any type of liquid substances.

e) All sand hoppers shall be tied-down with suitable anchors not more than three feet away from the hopper base (Cross Anchors). Brand is currently utilizing cross anchor that has a maximum strength of 4500lbs. Only for stability when empty.

f) Wire rope shall be in good condition and ran through the rigging eyes on top of the sand hopper crossways and anchored down by at least two fist clamps.

ALL CABLES WILL BE MARKED WITH BARRICADE TAPE TO PREVENT ANY ACCIDENTAL CONTACT WITH PASSING MOTORIZED EQUIPMENT.

g) Any Brand employee that will attempt to access the top of one of these sand hoppers will utilize a full body harness and will follow Brand's 100% fall protection policy.

16.2 Inspection

1. Before a sand hopper is transported to any Brand Jobsite/facility the Field Supervisor and the Equipment/Resource Manager will conduct a full inspection.
2. The intense inspection will consist of checking the following:
   a) Ladder system
   b) Welds (cracks/abrasions)
   c) Structural defects (corrosions, cross-brass, legs (pipes/angle))
   d) Rigging eyes (corrosion/wear)
   e) Dispensing spouts
3. Brand Area, Division or Site Office will also inspect the hoppers and will correct any deficiencies found during any inspections.
4. Brand strives on the highest grade of safety from the start to the finish of any job that means even during the setting-up process. All Field Supervisors will attend a training course before he/she will take responsible to set-up a sand hopper. The Site Supervisor is responsible for weekly inspections on all Sand Hoppers that are set up on any Brand site.

17.0 BULK BAG RACK

17.1 Bulk Bag Rack systems will be utilized when working with bulk bag abrasive material. These racks are designed to fit inside "nesting" collars that have been welded to the top shell of the bulk blast unit to support the rack. These systems allow the bulk bag load to be supported so the operator will not work under a suspended load. An operator will never work under a suspended load.

17.2 Install according to manufacturers recommended procedures and maintain and inspect as required.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX A

BULK BLASTER
OPERATING AND MAINTENANCE INSTRUCTIONS

NOTE: This procedure follows the "Best Practices" guidelines described in a consolidation of the owner's manuals. Brand has several models and generations of abrasive blasting equipment. The valve numbers used in this procedure reflect the diagrams in Appendix II, of this procedure and could vary if the unit has been altered. If the bulk blaster has been modified from its original design, or if the unit was designed by a different manufacturer, appendix I, II, and, III may not apply. Please refer to the equipment owner's manual for specific operating and maintenance instructions. The Resource Equipment/Resource Manager or their designee(s) can assist you in obtaining the required procedures.

OPERATING PROCEDURES TO FILL BULK UNIT DEPRESSURIZING / FILLING PROCEDURE

1. CLOSE INLET SOURCE AIR BALL VALVE, CAUTION, THE BULL HOSE WILL STILL BE UNDER FULL PRESSURE BETWEEN THE COMPRESSOR AND THE BULK UNIT.
2. OPEN OUTLET/BLOW DOWN BALL VALVE
3. VERIFY ON THE GROUND THAT THE IS NO PRESSURE IN THE UNIT, (DO NOT RELY SOLELY ON PRESSURE GAUGES), CHECK FOR AIR PRESSURE AT THE PETCOCKS ON THE MOISTURE SEPARATOR OR CONTROL VALVES
4. DON FALL PROTECTION AS REQUIRED, ASCEND LADDER, OPEN PRESSURE INDICATING BALL VALVE, VERIFY THAT THERE IS NO PRESSURE IN THE UNIT. IF AIR PRESSURE IS PRESENT IMMEDIATELY CLOSE THE VALVE AND DESCEND TO THE GROUND LEVEL AND WAIT FOR UNIT TO DEPRESURIZE. NEVER BLOW DOWN THE UNIT THROUGH THE PRESSURE INDICATING BALL VALVE
5. REMOVE LOCK ON CLOSURE DEVICE (LOCK OUT/TAG OUT), OPEN PNEUMATIC CLOSURE DEVICE AND SWING OUT OF THE WAY. (PNEUMATIC CYLINDER PIN SHOULD BE IN THE DOWN POSITION)
6. PULL THE CAM LOCK HANDLES DOWN FIRST, ONE BY ONE, IN A "STAR PATTERN AS OUTLINED IN THE MANUAL, DO NOT SWING THE "T" BOLTS BACK. DO NOT USE ANY TYPE OF TOOL. CAM LOCK HANDLES SHOULD BE PULLED BY HAND. IF THE HANDLES PULL HARD REVERIFY THAT THERE IS NO PRESSURE IN THE UNIT
7. SWING THE "T" BOLTS BACK IN THE SAME ORDER AS THE CAM LOCKS, SWING THE LID OPEN
8. PLEASE REFER TO PRODUCT MANUAL FOR MORE IN DEPTH DESCRIPTION OF PROCEDURES

    a) Make sure the vessel is not under any pressure by:

    - Closing the 2" inlet ball valve (# 9c) (This prevents abrasive from contaminating the control) then, Caution, The bull hose will still be under pressure between the compressor and the Blast Unit.
    - Opening the 1-1/4" blow-down valve (# 6), which is located above the man-way at the rear of the vessel.

    b) Open the top closure (# 1) by:

    - Pulling the cam-lock (# 3) handles open and pulling the swing bolts clear.

APPENDIX A – BULK BLASTER, OPERATING & MAINTENANCE INSTRUCTIONS
(PAGE 2 OF 3)

NOTE: If there is a great deal of resistance encountered in attempting to open the cam-lock handles, make absolutely sure the vessel is NOT under any pressure before proceeding any further.

- Swing the lid away, so it completely clears the 10” opening.

c) To fill from a storage hopper, pull the vessel (Bulk Pot) under the side valve on the bottom of hopper and fill through the 10” quick opening (#1) on top of the vessel, open the slide valve, and let fill screen material as needed.

d) To fill from a bulk bag, load bulk bag into the Bulk Bag Rack located on top of the vessel, after load is down and supported by the bulk bag rack, open bulk bag bottom spout and fill unit. Screen material as needed.

e) Inspect the “O” ring in the closure, remove excess material, Re-Close the 10” closure (# 1) in the reverse order of the opening procedure as outlined earlier, making sure cam-locks (# 3) and swing bolts are securely in place and locked.

- Install Pneumatic closure device and re-lock
- Close Pressure Indicating Valve

9. TO TURN SYSTEM ON

a) Connect the blast hose to quick coupling. All abrasive blast hose couplings are provided with holes though which wire or a pin shall be inserted to prevent accidental disconnection. Be sure these are in place and intact.

b) Close 1-1/2” manuals choke valves (# 9a) along side of the moisture trap (# 9b), and leave them completely closed. Extended operation with the choke valve partially closed will cause excessive wear in the metering valve.

c) Close the blow-down valve (# 6) at the rear of the vessel, above the man-way.

d) Plug the remote control hoses or lines into the proper connections, being sure dead-man control lever is not depressed. Test the dead-man switch to insure the proper solenoid is being activated, then unplug the dead-man line.

e) Qualified Blaster will then take control of the nozzle.

f) Opening the air inlet valve (9c) at the moisture trap will pressurize the vessel. Prior to this step, make sure pressure gauge and pressure relief valve are properly installed.

g) Plug in the dead-man lines and then open the choke valve(s) (9a).

10. TO BLAST

a) Depress the lever on the dead-man valve (#1). This will turn on the blast air along with the adjusted amount of abrasive flow.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX A – BULK BLASTER, OPERATING & MAINTENANCE INSTRUCTIONS
(PAGE 3 OF 3)

b) Abrasive flow can be adjusted with the control knob on the metering valve. Turn clockwise for less abrasive and counter-clockwise for more abrasive. Due to the length of the abrasive blast hose, there will be a slight delay in control of abrasive at the nozzle, so allow a few seconds before making further adjustments.

c) The ball valve (# 9b) on bottom of the moisture trap shall be kept slightly open when the machine is in use to permit moisture to drain off. Once each day, open completely to blow out excess accumulation.

11. BLOW DOWN

a) Close the 2" inlet ball valve (#9a) to prevent the possibility of abrasive contaminating the controls.

b) Open the 1-1/4" blow-down valve (#6), which is located above the man-way, at the rear of the vessel.

12. TROUBLE SHOOTING PROCEDURES

a) AIR STOPS BUT MACHINE WON'T SHUT OFF ABRASIVE

- Foreign matter stuck between plunger and seat in the metering valve
- Defective valve plunger in metering valves.
- Defective sleeve in metering valves.
- Blocked air hose to metering valve.
- Defective spring in metering valve (Check length of spring).
- Cap on metering valve not screwed all the way down (hand tight).

b) ABRASIVE STOPS BUT MACHINE WON'T SHUT OFF AIR FLOW

- Defective spring in automatic air valve.
- Defective seat in automatic air valve.
- Blocked air hose to automatic air valve.
- Defective O-Ring in automatic air valves0). (Around shaft).

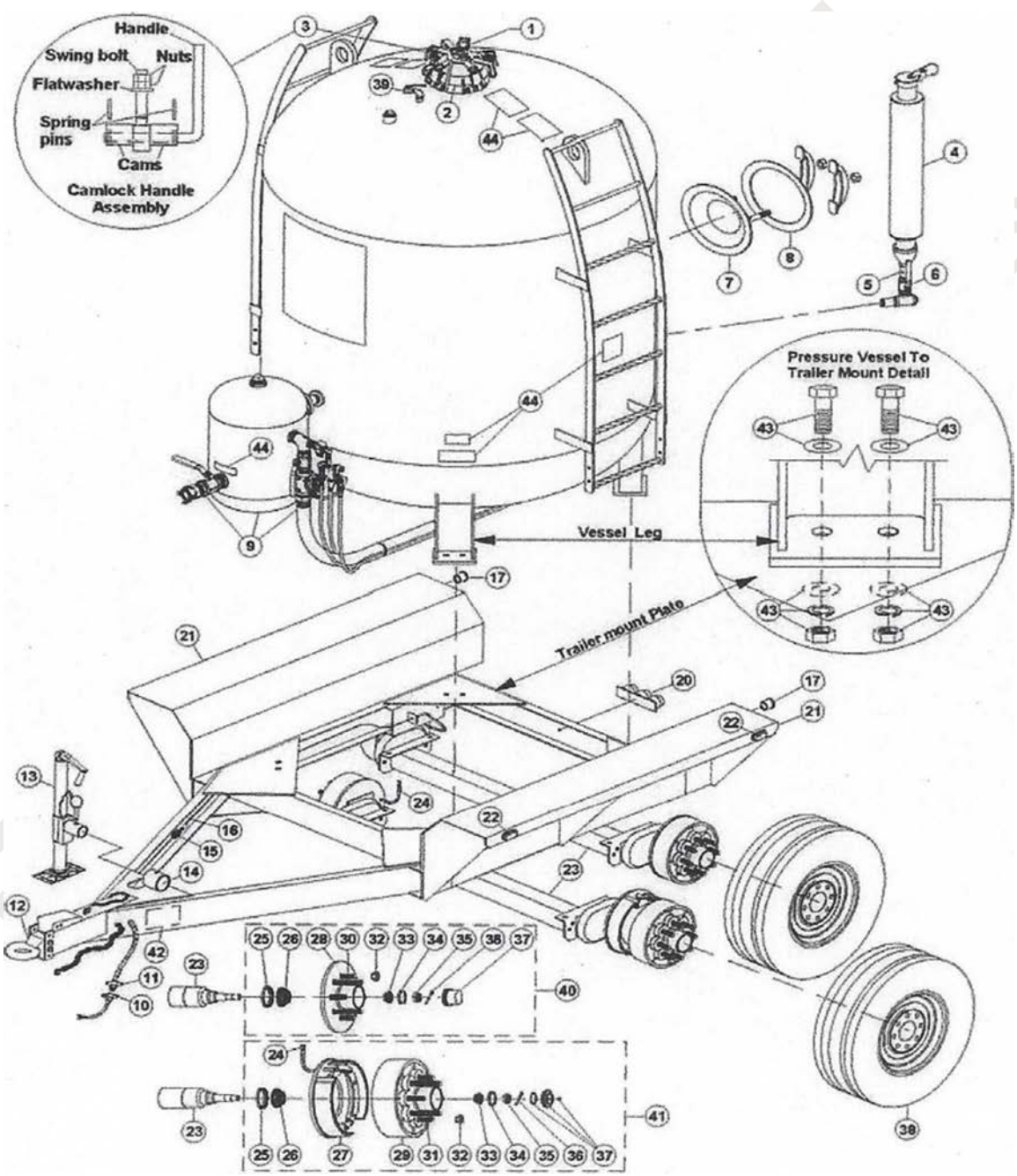
c) MACHINE WON'T SHUT OFF ABRASIVE OR AIR

- Control lines to dead-man valve closed.
- Dead-man valve of improper design has been installed. The dead-man valve must be a 3- way valve.
- Control valve stuck in ON position.
- Blocked control lines.
- Defective dead-man valve. Cartridge insert valve under handle stuck down.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX B

SCHMIDT SYSTEMS DIAGRAMS



ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX C

SCHMIDT VESSEL AND TRAILER PARTS LIST

PARTS LIST – VESSEL TRAILER

No.	Part No.	Description
1.	7007-519	Closure Assembly, 10"
2.	7007-519-03	Closure O-Ring, 10"
3.	7007-519-02 7007-319-02	Cam Lock Handle Assy. (5 bolt closure) Cam Lock Handle Assy. (3-4 bolt closure)
4.	3029-007-99	Nipple, 1¼" x close
5.	3006-007	90º Street Elbow, 1¼"
6.	2401-507	Ball Valve, 1¼"
7.	7000-002-07	Manway Crab Assembly, 11" x 15"
8.	7000-002-06	Manway Gasket, 11" x 15"
9.	See page 6-7 See page 8-9	Pneumatic Control System Electric Control System
10.	7052-001	Trailer Connector, female
	7052-002	Trailer Connector, male
12.	7042-000	Hydraulic Actuator
13.	7050-001	Swivel Jack with foot
14.	7050-002	Jack Adapter (weld on)
15.	2405-804	Brake Shut Off Valve
16.	7042-001	Steel Brake Line Kit
17.	7051-120 7051-130	Red Taillight Red Taillight for license plate
18.	7036-001	Frame Grommet
19.	4214-308-01	Blast Hose Coupling
20.	7051-110 3	Red Light Bar
21.	7139-120-04 7139-160-04	Fender for 12,000 lb. trailer (specify left or right) Fender for 16,000 lb. trailer (specify left or right)
22.	7051-100 7051-101	Red Clearance Light Amber Clearance Light
23.	7040-106 7040-108 7040-206 7040-208	Rigid Axle (axle only) for 12,000 lb. trailer Rigid Axle (axle only) for 16,000 lb. trailer Torsion Suspension Axle (axle only) for 12,000 lb. trailer Torsion Suspension Axle (axle only) for 16,000 lb. trailer
24.	4114-002	Brake Hose for 12,000 lb. or 16,000 lb. trailer
25.	7045-106-10	Grease Seal for 12,000 lb. or 16,000 lb. trailer
26.	7045-106-09	Inner Bearing for 12,000 lb. or 16,000 lb. trailer
27.	7042-260 7042-261 7042-280 7042-281	Right Brake Assembly for 12,000 lb. trailer Left Brake Assembly for 12,000 lb. trailer Right Brake Assembly for 16,000 lb. trailer Left Brake Assembly for 16,000 lb. trailer
28.	7041-106 7041-108	Hub for 12,000 lb. yard trailer (6 lugs) Hub for 16,000 lb. yard trailer (8 lugs)
29.	7045-106 7045-108	Hub and Drum for 12,000 lb. highway trailer (6 lugs) Hub and Drum for 16,000 lb. highway trailer (8 lugs)
30.	7045-106-04 7045-108-04	Lug Stud for 12,000 lb. yard trailer Lug Stud for 16,000 lb. yard trailer
31.	7045-106-05 7045-108-05	Lug Stud for 12,000 lb. highway trailer Lug Stud for 16,000 lb. highway trailer
32.	7045-106-03 7045-108-03	Lug Nut for 12,000 lb. trailer Lug Nut for 16,000 lb. trailer
33.	7045-106-08 7045-108-08	Outer Bearing for 12,000 lb. trailer Outer Bearing for 16,000 lb. trailer
34.	7045-106-07	Spindle Washer for 12,000 lb. or 16,000 lb. trailer
35.	7045-106-06	Spindle Nut for 12,000 lb. or 16,000 lb. trailer
36.	7119-001	Cotton Pin
37.	7045-106-02 7045-108-01	Push on Dust Cap for 12,000 lb. trailer Screw on Dust Cap with O-Ring and plug for 16,000 lb. trailer
38.	7045-106 7046-208 7043-106 7043-108 7044-100 7044-200	Tire and Wheel for 12,000 lb. trailer (6 lugs) Tire and Wheel for 16,000 lb. trailer (8 lugs) Wheel for 12,000 lb. trailer (6 lugs) Wheel for 16,000 lb. trailer (8 lugs) Tire for 12,000 lb. trailer Tire for 16,000 lb. trailer

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX D

SCHMIDT BLASTING DATA REFERENCE CHART

AIR CONSUMPTION (CFM) PER BLAST NOZZLE

Nozzle	Size	Nozzle Pressure					
		70 psi	80 psi	90 psi	100 psi	120 psi	140 psi
No. 2	1/8"	16	18	20	22	26	30
No. 3	3/16"	36	41	45	49	58	66
No. 4	1/4"	65	72	80	90	105	121
No. 5	5/16"	101	113	125	150	160	185
No. 6	3/8"	145	163	182	200	235	270
No. 7	7/16"	193	215	240	270	315	360
No. 8	1/2"	260	290	320	350	410	470
No. 10	5/8"	406	454	500	550	640	740
No. 12	3/4"	585	652	720	790	925	1060

ABRASIVE CONSUMPTION (lbs. per hour) PER BLAST NOZZLE

Nozzle	Size	Nozzle Pressure					
		70 psi	80 psi	90 psi	100 psi	120 psi	140 psi
No. 2	1/8"	105	115	130	140	165	190
No. 3	3/16"	230	260	290	320	375	430
No. 4	1/4"	420	460	500	560	660	760
No. 5	5/16"	650	725	825	900	1050	1200
No. 6	3/8"	945	1050	1150	1260	1475	1700
No. 7	7/16"	1300	1450	1600	1750	2050	2350
No. 8	1/2"	1660	1850	2000	2250	2650	3000
No. 10	5/8"	2600	2900	3125	3520	4100	4750
No. 12	3/4"	3750	4180	4500	5060	5950	6800

HOSE SELECTION GUIDE FOR BLASTING AT 100 psi

Nozzle	No. 4	No. 5	No. 6	No. 7	No. 8
SIZE	1/4"	5/16"	3/8"	7/16"	1/2"
CFM at 100 psi	90	150	200	270	350
AIR HOSE	1¼"	1¼"	1½"	1½"	2"
BLAST HOSE	1"	1¼"	1¼"	1½"	1½"
MATERIAL (approx.. lbs. per hour)	580	900	1260	1750	2250

Air volume and pressure are very important. The blasting production rate will increase with higher blasting pressures and decrease with lover blasting pressures. The National Association of Corrosion Engineers data suggests that 1.5% of production is lost for each 1 psi reduction in blast nozzle pressure. Pressure drop through the blast unit itself is normally less than 1 psi with a Schmidt unit, although blast units manufactured by some of our competitors have pressure loss as high as 12 psi resulting in an 18% loss of production. Air pressure loss can also be avoided by using the shortest possible hose of adequate size. The inside diameter of both the blast hose (other than the whip hose) and the air hose should be approximately three times the diameter of the orifice in the blast nozzle.

Standard Schmidt blast units are rated for a maximum pressure of 125 psi although high pressure units rated for 150 psi are available on request.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX E

CLEMTEX PBT AND SBT BULK BLASTER

Note: This procedure follows the Clemtex PBT & SBT Bulk Blaster guidelines described in the owner's manual. The valve numbers used in this procedure reflect the diagram in the Appendix of this procedure and could vary if the unit has been altered. If the bulk blaster has been modified from its original design, or if the unit was designed by a different manufacturer, the Appendix may NOT reflect the unit being used. Please refer to the equipment owner's manual for specific operating and maintenance instructions. The Equipment/Resource Manager or their designee(s) can assist you in obtaining the required procedures.

OPERATING PROCEDURE:

1. HOSE (AIR AND BLAST)
   a. Check all air hoses for wear, leaks or bad covers. No hose shall be used that is not in a safe condition.
   b. Check all connections on hoses for proper connection, leaks, and lanyards (pins to keep connections secure).
   c. Check all blast hose for wear (can be easily identified by squeezing the hose to check for soft spots).
   d. While in use, hose shall be laid out in as straight of a line as possible to prevent bends and curves in the hose. This helps to prevent internal erosion of the hose and prolongs the life of the hose.
   e. Check blast hose couplings for wear gaskets, and adequate seal.
2. PREPARING THE ABRASIVE BLAST MACHINE (BEFORE PRESSURIZING THE TANK).
   a. Start the compressor and allow the compressor to reach operating temperature.
   b. Check to see the abrasive level in the tank with the inlet valve (see diagram) #4 closed and The exhaust valve #1 and #3 open. If needed, fill the tank with abrasive through top material inlet #2. After full, close lid and secure cam lock handles #5 in the closed position.
   c. With inlet valve #4 closed and one or both exhaust vales #1 & #3 open, connect blast hose, control line and hook all other accessories (hoods, filters, etc).
   d. DO NOT PRESSURIZE THE TANK UNTIL ALL PREPARATIONS HAVE BEEN MADE TO DO THE JOB REQUIRED. (JSP, permits, inspection forms, etc).
3. TO PRESSURIZE TANK
   a. Make sure pressure gauge relief valve are properly installed. Open safety petcock on control box.
   b. Open air to tank from compressor.
   c. Close both exhaust valves (see diagram) #1 and #2.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX E – CLEMTEX PBT AND SBT BULK BLASTER
(PAGE 2 OF 2)

d. SLOWLY open inlet air to the tank (inlet #4), as tank begins to fill checks all hoses for leaks connections, and the tanks piping, man ways, and material inlet #2 for leaks. If any leaks are found, the unit must first be de-pressurized and the leaks then fixed.

e. When the tank is pressurized fully and the machine is ready to blast, close petcocks on control boxes.

NOTE: NEVER WORK ON THE TANKS WHILE THE SYSTEM IS PRESSURIZED. VALVES #'2 1 AND 3 MUST BE OPEN AND VALVE #4 MUST BE CLOSED. ANY ALTERATION TO THE TANK MAY AFFECT THE ISOLATION SEQUENCE OF THIS PROCEDURE.

4. TO DE-PRESSURIZE THE TANK

a. Open safety petcocks on the tank.
b. Close inlet valve #4 on the tank.
c. Open both exhaust valves #1 & #2. The exhaust valve must be open before doing anything to the material inlet lid #2.
d. Wait until the air has de-pressurized completely before opening the tank

5. REFILLING THE TANK WITH ABRASIVES (THE TANK MUST NOT BE UNDER PRESSURE).

a. Open exhaust valve #1 on tank.
b. Open material inlet valve #2 by loosening the cam lock handles. Do not loosen
c. The nuts on the lid. The nuts are for adjusting and removing the lid. DO NOT LOOSEN THE CAM LOCK NUTS IF THEY ARE HARD TO LOOSEN. THIS MAY BE CAUSED FROM PRESSURE ON THE TANKS. CHECK WITH YOUR SUPERVISOR BEFORE PRECEEDING.

d. After the tank has been filled with abrasive, secure the lid tightly and close the exhaust valve(s).

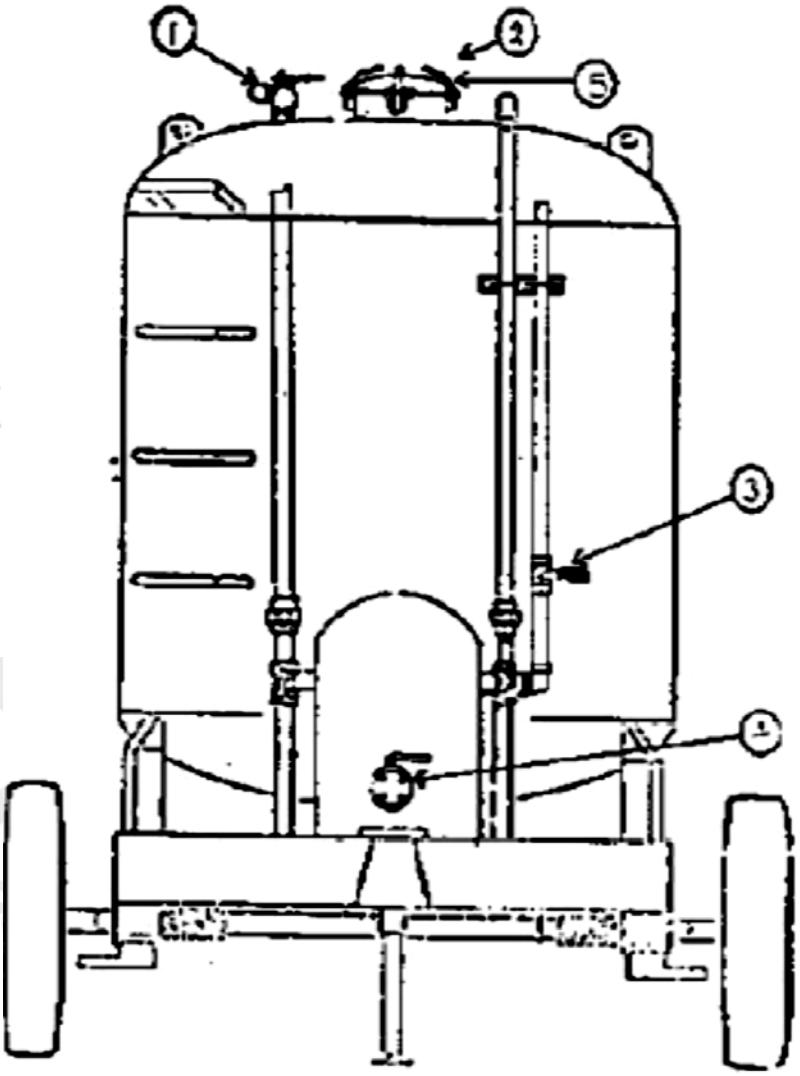
ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX F

CLEMTEX PBT AND SBT BULK BLASTER SYSTEM DIAGRAM

1. TOP EXHAUST VALVE
2. MATERIAL INLET
3. EXHAUST VALVE
4. INLET VALVE
5. CAM LOCK HANDLE

CLEMTEX BULK BLASTER

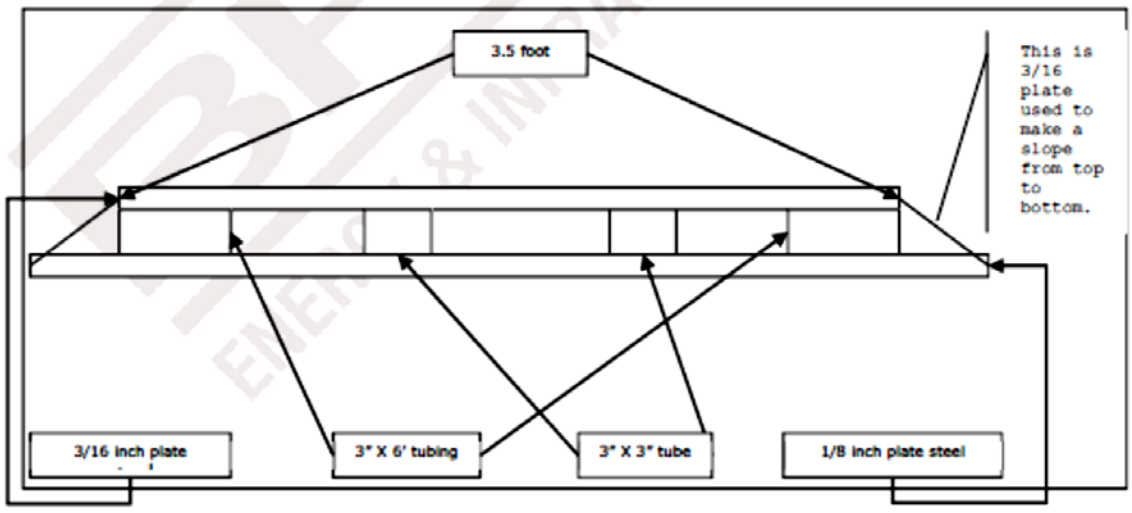


ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX F – CLEMTEX PBT AND SBT BULK BLASTER DIAGRAM
(PAGE 2 OF 3)

Pound (Six Sack) Abrasive Pot

1. Equipment Inspection
   a) Empty the abrasive pot before attempting to move the pot.
   b) Check the condition of the tires and proper inflation.
   c) Remove any loose objects that could fall or obstruct the wheels.
   d) Remove hoses that may be attached to the pot.
   e) Check that pressure gauge and relief valve are properly installed, sized and rated based on the ASME tag.
2. Route Establishment
   a) Pre-determine a route that you want to use when you move the pot. Try to route your move over level ground, and free from obstacles.
   b) Locate the transport equipment (truck) as close as possible to the abrasive pot.
3. Transporting Pots
   a) All six bag pots shall be mounted permanently to skids or mobile truck rigs.
   b) Personnel are not allowed to handle six bag pots. All six bag pots when purchased will be permanently mounted to skids to prevent personnel from attempting to move pots manually. All pots will be moved only through use of material handling equipment.
4. Forklift
   a) Mount Specifications



ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX F – CLEMTEX PBT AND SBT BULK BLASTER DIAGRAM
(PAGE 3 OF 3)

5. Mount Specifications

Pots must be mounted in a manner that protects controls from damage while being transported.

ABRASIVE BLASTING SAFE WORK PROCEDURES

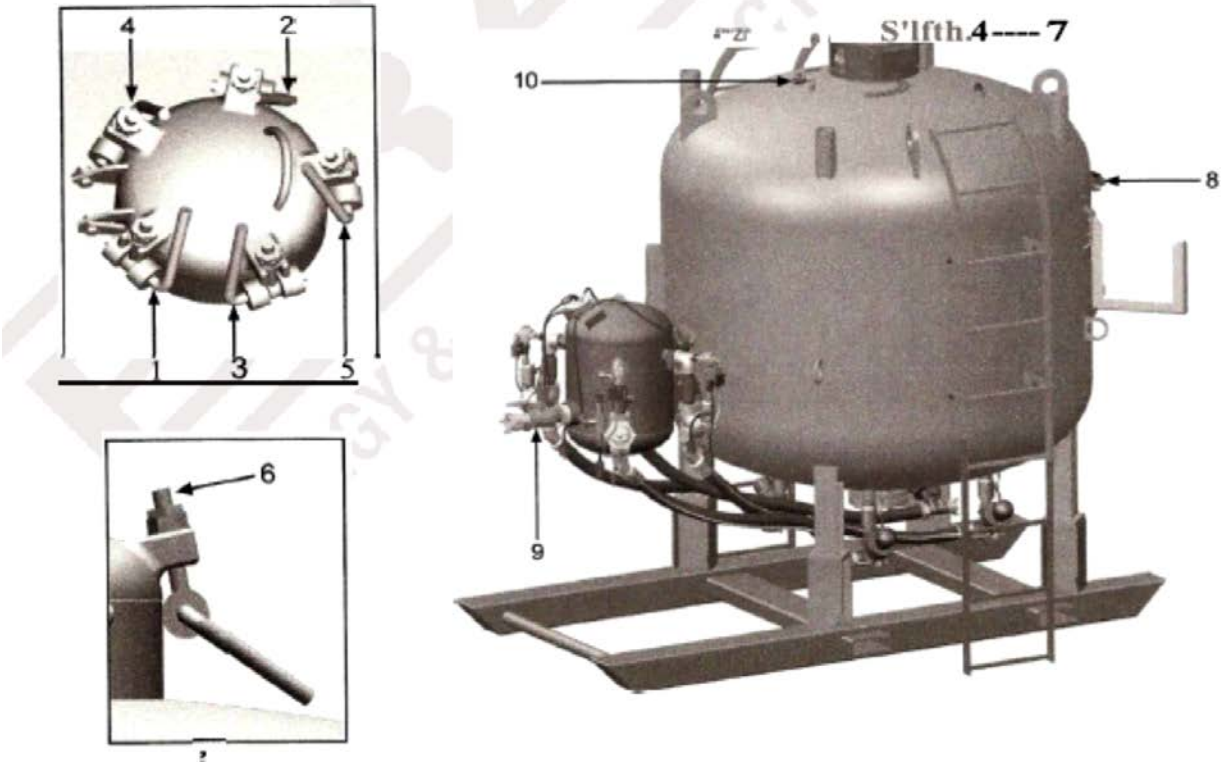
APPENDIX G

MARCO SYSTEMS DIAGRAM

1. Do not use any tools or devices to aid in moving a Camlock Handle or Swing Bolt during opening of the Hatch Assembly. If a Camlock Handle and Swing Bolt do not move freely during the opening of the Hatch Assembly stop immediately as the abrasive blasting pot could be under pressure. Ensure the abrasive blasting pot is depressurized before continuing with opening the Hatch Head. Failure to comply with the above warning could result in death or serious injury.

2. Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

3. Abrasive blasting pots are not intended for transport of personnel. Personnel should not be carried on the abrasive blasting pot during transit or moving of the unit as they can fall from the unit. Failure to comply with the above warning could result in death or serious injury.

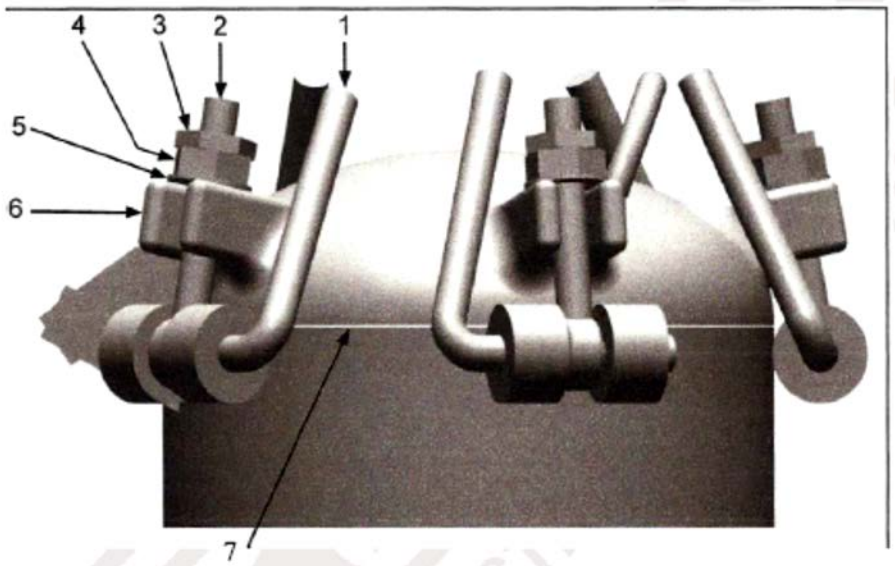


ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX H

ADJUST CAMLOCK ASSEMBLIES

Maintenance of the Blastmaster® 120 cu. ft. Abrasive Blasting Pot is limited to the daily cleaning and the immediate replacement of damaged or worn parts.



WARNING !

Always depressurize the entire system, disconnect all power sources and lockout/ tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.

Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects in any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX H – ADJUST CAMLOCK ASSEMBLIES
(PAGE 2 OF 2)

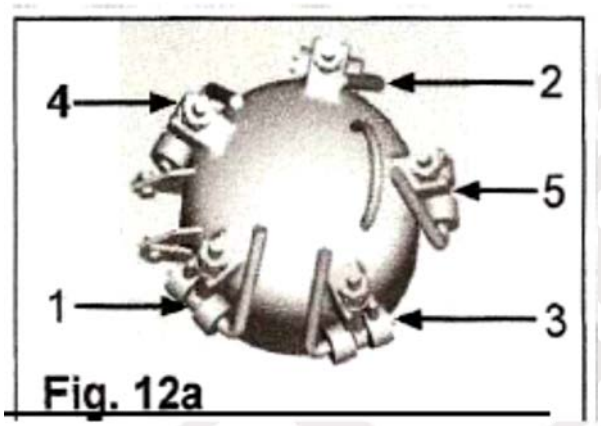


Fig. 12a

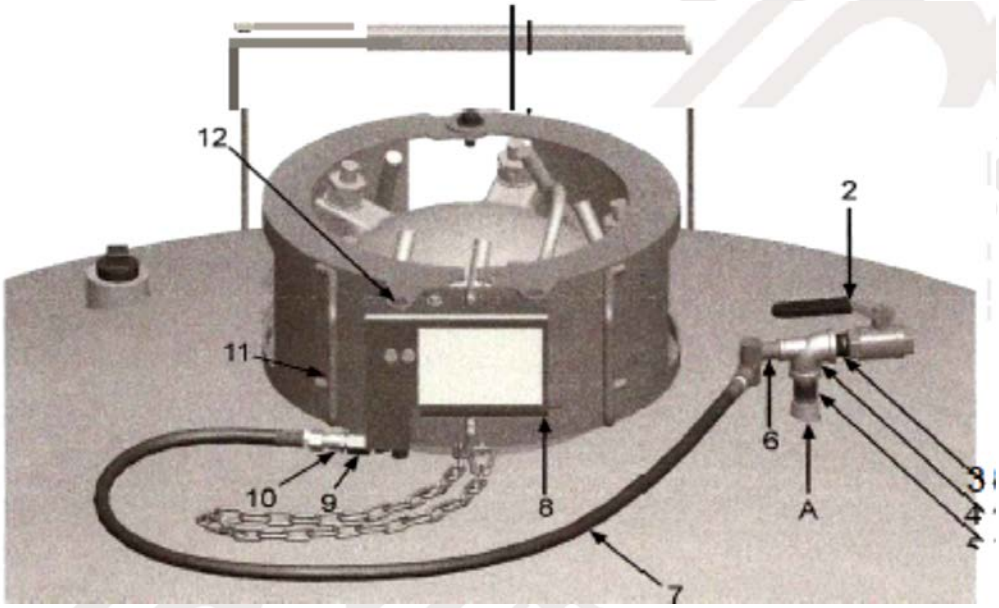
1. Open Hatch. Inspect Hatch 0-ring (7) and replace if damaged.
2. With Camlock Assemblies (1) in the closed position, loosen Locking Nut (3), then loosen Swing Bolt Nut (4), releasing Washer (5). Inspect items and replace if damaged.
3. Adjust Swing Bolt (2) position so it is fully seated in Holding Lug (6). Install Swing Bolt Nut on to Swing Bolt to hand tight. Do not over tighten.
4. Working one Camlock Assembly at a time, repeat steps 2 and 3 for remaining four Camlock Assemblies.
5. Using a torque wrench , tighten Swing Bolt Nut (2) on Camlock Assembly #5 to a final torque of 20 ft/lbs. Tighten remaining Swing Bolt Nuts in the sequence shown in Fig. 12a.
6. Install Locking Nut (3) on to Swing Bolt (2). Using a wrench to hold Swing Bolt Nut in place, tighten Locking Nut. Tighten remaining Locking Nuts in the sequence shown in Fig.12a.
7. Inspect Camlock Assemblies for proper function.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX I

INSTALL BLASTMASTER PNEUMATIC CLOSURE LOCKOUT DEVISE

Maintenance of the Blastmaster® 120 cu. ft. Abrasive Blasting Pot is limited to the daily cleaning and the immediate replacement of damaged or worn parts.



Install:

1. Depressurize abrasive blasting pot.
2. Place Blastmaster® Pneumatic Closure Lockout Device (1) on camlock closure as shown.
3. Remove existing piping from Port (A).
4. Install Pipe Nipple (5) into Port (A).
5. Install Elbow with Side-out (4) onto Pipe Nipple (5).
6. Install Close Nipple (3) into Elbow with Side-out (4).
7. Install Pressure Indicating Ball Valve (2) onto Close Nipple (3).
8. Install Swivel Connector (6) into Elbow with Side-out (4).
9. Install Reducing Fitting (9) into 1/8" 90° Elbow (not shown).
10. Install Swivel Hose End (10) into Reducing Fitting (9)
11. Connect Air Hose (7) into Swivel Connector (6) and Swivel Hose End (10).
12. Ensure Pressure Indicating Ball Valve (2) is in the closed position, and pressurize brasive blasting pot. Verify Pneumatic Locking Piston (12) engages Latch Handle (8). Grasp Latch handle and attempt to disengage from Blastmaster® Pneumatic Closure Lockout Device (1). The Latch Handle should not disengage.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX I – INSTALL BLASTMASTER PNEUMATIC CLOSURE LOCKOUT DEVICE

(PAGE 2 OF 2)

WARNINGS

1. Always depressurize the entire system, disconnect all power sources and lockout/ tagout all components before any maintenance or troubleshooting is attempted. Failure to comply with the above warning could cause electrical shock and inadvertent activation of equipment resulting in death or serious injury.
2. For equipment manufactured by entities other than Marco, you must consult the Original Equipment Manufacturer operator's manuals, information, training, instructions and warnings, for the proper and intended use of all equipment Failure to comply with the above warning could result in death or serious injury.
3. Moving parts can present an area where crushing, pinching, entanglement or amputation may occur. Do not place body parts or foreign objects ii n any area where there are moving parts. Failure to comply with the above warning could result in death or serious injury.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX J

PRESSURIZE & DEPRESURIZE ABRASIVE BLASTING POT OPERATING INSTRUCTIONS

WARNINGS:

1. Before attempting to open the Hatch Assembly, ensure the abrasive blasting pot is not pressurized by opening the Pressure Indicator Ball Valve located on the top of the abrasive blasting pot If air is released when the Pressure Indicator Ball Valve is opened do not attempt to open Hatch Assembly. Attempting to open the Hatch Assembly when the abrasive blasting pot is pressurized could release high speed abrasive and compressed air and allow the Hatch Assembly to be forced open. Follow proper depressurization instructions before proceeding. Failure to comply with the above warning could result in death or serious injury.
2. Do not use any component other than the attached ladders as climbing devices. Ensure appropriate Fall Protection is used when climbing the ladder. Failure to comply with the above warning could result in death or serious injury.
3. Release of high speed abrasive and compressed air occurs during depressurization of the abrasive blasting pot Ensure appropriate Personal Protective Equipment is in use. Failure to comply with the above caution may result in minor or moderate injury.

PRESSURIZATION:

- Ensure Abrasive Blasting Pot is on a stable surface. Block wheels of Trailer Mounted units to stop unintended movement.
- Ensure Abrasive Blasting Pot is not pressurized. Ensure Inlet Ball Valve (9) is in the closed position and Exhaust Ball Valve (8) is in the open position. Ascend ladder to inspect Pressure Indicator Ball Valve (10). Close Pressure Indicator Ball Valve.
- Inspect Hatch 0-ring (not shown) for damage and proper seating in groove, replace if needed.
- Ensure all components are free of corrosion and damage, replace if needed. Ensure Camlocks and Swing Bolts move freely without binding, replace if needed. Visually inspect internal components and abrasive level in vessel before filling.
- To secure Hatch, move Camlock (1) to the up position by hand only. Do not use any device or tool to aid in moving the Camlock. Do not move Swing Bolt (6) at this time.
- Move each Camlock to the up position, following the numbered sequence shown. Move all Camlocks to the up position and descend the ladder. Ensure Air Inlet Ball Valve (9) is in the open position and Exhaust Ball Valve (8) is in the closed position.
- Move Swing Bolt on first Camlock to the up position. Move each Swing Bolt to the up position in a star pattern with Camlock (5) being the last one.
- Close Blastmastere Pneumatic Closure Lockout Device (7) around Hatch. • Close Outlet Ball Valve (8).
- Open Inlet Ball Valve (9) to begin pressurization.

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX J – PRESSURIZE & DEPRESURIZE ABRASIVE BLASTING POT OPERATING INSTRUCTIONS

(PAGE 2 OF 2)

DEPRESSURIZATION:

- Move Inlet Ball Valve (9) to the closed position.
- Move Exhaust Ball Valve (8) to the open position.
- When air has stopped exhausting from the Exhaust Ball Valve (8), ascend ladder to inspect Pressure Indicator Ball Valve (10). Open Pressure Indicator Ball Valve (10). If no air is released from the Pressure Indicator Ball Valve continue with removing the Blastmastere Pneumatic Closure Lockout Device (7).
- Disengage Blastmastere Pneumatic Closure Lockout Device (7) and slide away from Hatch.
- To open Hatch, move Camlock (1) to the down position by hand only. Do not use any device or tool to aid in moving the Camlock. Do not move Swing Bolt (6) at this time. Move each Camlock to the down position, following the numbered sequence shown. If at any time during the moving of the Camlocks, air is released from the Hatch opening, stop immediately. Move all Camlocks to the up position and descend the ladder. Ensure Air Inlet Ball Valve (9) is in the closed position and Exhaust Ball Valve (8) is in the open position. If air is not released when the Camlocks are in the down position, continue with opening the Hatch.
- Move Swing Bolt (6) on first Camlock to the down position. Move each Swing Bolt to the down position in a star pattern with Camlock (5) being the last one. If at any time during the moving of the Swing Bolts, air is released from the Hatch opening, stop immediately. Return all Swing Bolts to the up position and return the Camlocks to the up position.
- Ensure Air Inlet Ball Valve (9) is in the closed position and Exhaust Ball Valve (8) is in the open position.
- Inspect Hatch 0-ring for damage and proper seating in groove, replace if needed. Ensure all components are free of corrosion and damage, replace if needed. Ensure Camlocks and Swing Bolts move freely without binding, replace if needed.Visually inspect internal components and abrasive level in vessel before filling.

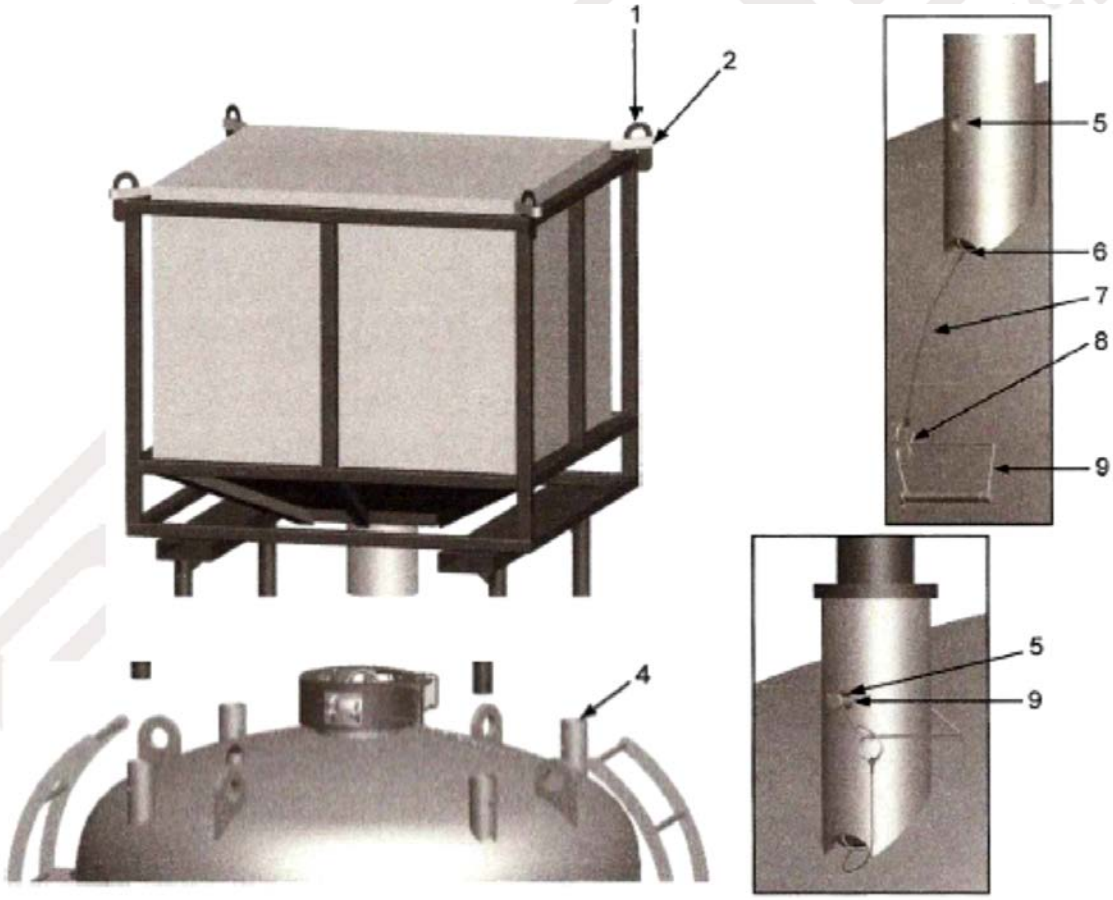
ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX K

BLASTMASTER BULK BAG RACK

WARNINGS

1. Always remove any locking device securing the bulk bag rack before attempting removal. Do not use the installed bulk bag rack as a lifting device for the abrasive blasting pot. Lifting an abrasive blasting pot using the bulk bag rack can cause the abrasive blasting pot to become unstable and damage components. Failure to comply with the above warning could resultin death or serious injury.
2. Do not transport abrasive blasting pot with bulk bag rack installed. Transporting abrasive blasting pot with bulk bag rack installed could cause the abrasive blasting pot to become unstable or allow the bulk bag rack to become disengaged from the abrasive blasting pot. Failure to comply with the above warning could result in death or serious injury.



Weight: 620 pounds

Overall Dimensions: Length: 62", Width: 60", Height: 80"

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX K – BLASTMASTER BULK BAG RACK
(PAGE 2 OF 5)

WARNINGS

1. For equipment manufactured by entities other than Marco, you must consult the Original Equipment Manufacturer operator's manuals, information, training, instructions and warnings, for the proper and intended use of all equipment Failure to comply with the above warning could result in death or serious injury.
2. Inspect all equipment for wear or damage before and after each use. Failure to use Original Equipment Manufacturer repair parts and failure to immediately replace worn or damaged components could void warranties and cause malfunctions. Failure to comply with the above warning could result in death or serious injury.
3. Keep clear of Bulk Bag Rack Collars when lowering or raising Bulk Bag Rack into operating position. Do not attempt to guide the Bulk Bag Rack into position with the use of hands or feet Failure to comply with the above warning could result in death or serious injury.

BEFORE USE:

If Equipped:

1. Place Lanyard Assembly (7) into opening of Blastmaster® Bulk Bag Rack Collar (4), as shown. Ensure Split Ring (8) exits Hole (6) at base of Blastmaster® Bulk Bag Rack Collar.
2. Install Locking Pin (9) onto Lanyard Assembly (7) by threading Split Ring (8) through hinge on Locking Pin.

Installation:

- Ascend abrasive blasting pot ladder and ensure Locking Pins (9) are not inserted in Bulk Bag Rack Collar Pin Holes (5).
- Open hatch per instructions.
- Descend abrasive blasting pot ladder.
- Place abrasive bulk bag in Blastmaster® Bulk Bag Rack.
- Secure Bulk Bag in position by placing Blastmaster® Bulk Bag Lifting Loops (2) over Blastmaster® Bulk Bag Rack Lifting Eyes (1).
- Attach lifting device to Blastmaster® Bulk Bag Rack Lifting Eyes (1), or use Fork Pockets, if equipped.
- Raise and position Blastmaster® Bulk Bag Rack Legs (3) in Blastmaster® Bulk Bag Rack Collars (4).
- Ascend abrasive blasting pot ladder and, if equipped, insert Locking Pin (9) through Pin Holes (5) in Blastmaster® Bulk Bag Rack Collar (4) and Blastmaster® Bulk Bag Rack Legs (3). Repeat on remaining three Blastmaster® Bulk Bag Rack Collars.

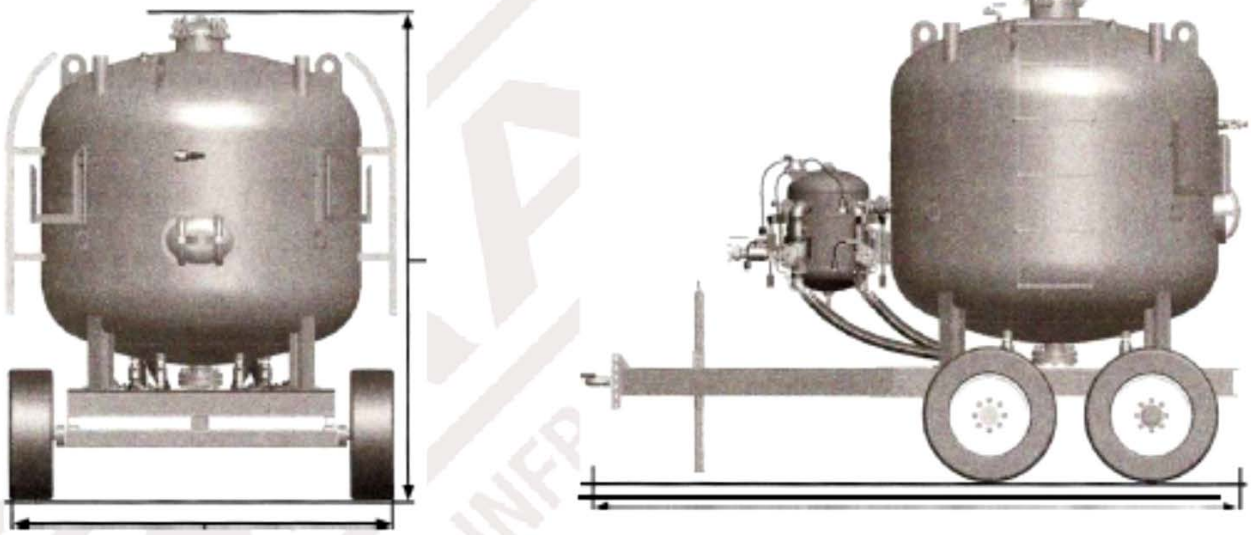
ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX K – BLASTMASTER BULK BAG RACK
(PAGE 3 OF 5)

AFTER USE:

If Equipped:

1. Ascend abrasive blasting pot ladder and remove Locking Pins (9) from Blastmaster® Bulk Bag Rack Collar Pin Holes (5).
2. Descend abrasive blasting pot ladder.
3. Attach lifting device to Blastmaster® Bulk Bag Rack Lifting Eyes (1), or use Fork Pockets, if equipped.
4. Raise Blastmaster® Bulk Bag Rack out of Blastmaster® Bulk Bag Rack Collars (4) and lower to the ground.
5. Ascend abrasive blasting pot ladder and close hatch.

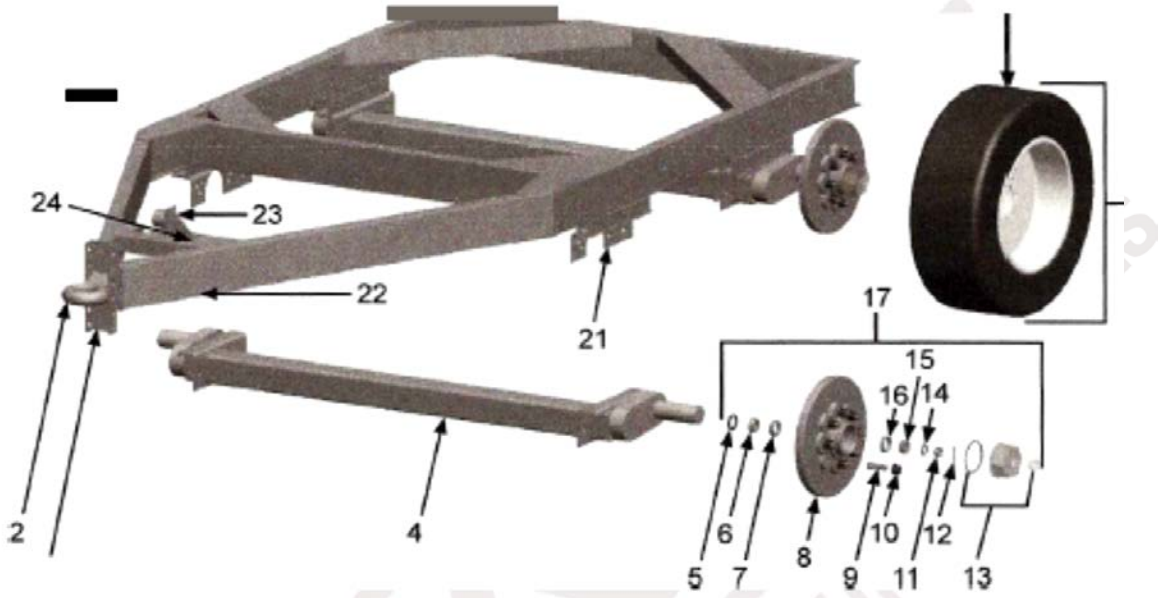


Dry Weight: Yard Trailer Model - 4950 pounds	
Overall Dimensions:	
A:	108"
B:	89"
C:	145"
D:	Adjustable 19"-23"

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX K – BLASTMASTER BULK BAG RACK
(PAGE 4 OF 5)

YARD TRAILER



YARD TRAILER PART #'S & DESCRIPTIONS		
ITEM #	**PART #**	**DESCRIPTION**
	1081663	Yard Trailer
1	10100482	Tongue Jack
2	10100481	Pintle Eye Coupler
3	10100471	Adjustable Hitch Mount
4	10100564	Torsion Axle - Yard Trailer
5	10100571	Oil Seal
6	10100578	Inner Bearing
7	10100580	Inner Bearing Cup
8	10100566	Idler Hub - Yard Trailer
9	10100568	5/8-18 UNF Lug Stud
10	10100569	5/8-18 Lug Nut
11	10100591	Spindle Nut
12	12 10100477	Cotter Pin for Spindle Nut

ABRASIVE BLASTING SAFE WORK PROCEDURES

APPENDIX K – BLASTMASTER BULK BAG RACK
(PAGE 5 OF 5)

YARD TRAILER PART #'S & DESCRIPTIONS (CONT.)		
ITEM #	**PART #**	**DESCRIPTION**
13	10100592	Oil Cap with Plug and 0-Ring
14	10100590	Spindle Washer
15	10100579	Outer Bearing
16	10100581	Outer Bearing Cup
17	10100566	Idler Hub Assembly – Yard Trailer (includes Item #'s 5 – 16)
18	10100478	Wheel and Tire Assembly (includes Item #'s 19 and 20)
19	10100479	Wheel *(8-Lug)*
20	10100480	215 - 17.5" 16-Ply Tire
21	10100476	#13 Axle Mount Bracket
22	10100585	Safety Label
23	10100483	Jack Mount Assembly
24	1091053	Hazard Identification Sticker - Tire Installation
25	10100701	3/4-10 x 2-1/2" Bolt *(Eight Required)*
26	10100596	*314"* Lock Washer *(Eight Required)*
27	10100704	*314"* Flat Washer *(16 Required)*
28	10100595	3/4" Nut *(Eight Required)*
	10100493	Chain Assembly *(Not Shown) (Two Required)*

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM A (PAGE 1 OF 2)

DAILY INSPECTION FORM BULK BLASTER / AUTO BLASTER

EQUIPMENT / LOCATION INFORMATION:	
Equipment #	Location:

ITEM TO INSPECT:	N/A	YES
1. Have all applicable permits and coatings analysis lab results been obtained from the client?	○	○
2. Has a Job Safety Analysis been conducted for the daily job scope and reviewed by all personnel?	○	○
3. Personnel qualified and possess proper documentation & PPE to operate and shut down the equipment?	○	○
4. Bull-Hose securely connected w/proper attachment (no banded bull-Hoses allowed) & in good condition?	○	○
5. All hoses on auto blaster securely pinned/wired, installed in a manner to not pose a puncture threat, not kinked or looped and whip checks installed on all hose connections and couplings?	○	○
6. Man-way (cam-lock) lid closed and securely fastened and Bleed-off valve closed?	○	○
7. All valves free and operating in good condition including Pinch or Thompson valve. Hose couplings at bulk pot are securely fastened; all screws installed and are complete with gaskets?	○	○
8. Where used, are the hoses properly positioned through the Pinch valve(s) and wired and has the hose been physically inspected at the pinch point?	○	○
9. Hard piping in good physical condition?	○	○
10. Bulk Pot grounded with #6 copper wire or the equivalent. Equipment being blasted is grounded to the same grounding rod as the bulk-pot and tested with less than 1-ohm resistance, pot to nozzle?	○	○
11. Electric/pneumatic Dead-Man switch attached to blast hose in close proximity to nozzle and been tested and is functioning properly. Electrical wiring to dead-man in good condition, waterproof and free of splices cuts and wear. Solenoid and solenoid valve(s) tested and working properly?	○	○
12. All dead man power cables are properly connected to the 12V dead man system without exposed wires, cuts or wear. Outer shield on cables properly inserted and secured within in plugs so no inner wiring in dead man cable is exposed.	○	○
13. Electrical connection box is in good condition and has a cover installed? Source power cable is connected to 12 volt side of battery not 24V.	○	○

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM A – DAILY INSPECTION FORM – BULK BLASTER / AUTO BLASTER (PAGE 2 OF 3)

ITEM TO INSPECT:	N/A	YES
14. Pressure relief valve installed in the vertical position and sized/rated properly . Pressure relief valve cannot be disabled by any means and must be properly sized for bulk-pot rating.	◯	◯
15. System pressurized and free of leaks?		
16. Trailer, Tires and wheels in good condition?	◯	◯
17. Controlled area barricaded properly and warning signs in place and legible?	◯	◯
18. Lock Out / Tag Out & Pneumatic Closure System in place?	◯	◯
19. Blowdown Muffler in place?	◯	◯
20. Means of communication between blaster(s) and stand-by established? ◯ Hand Signal ◯ Horn Signal	◯	◯
21. Pressure gauge is installed at inlet by moisture separator?	◯	◯
22. Airline filter & CO monitor inspected for breathing air ?	◯	◯
23. Are all hoses rated for proper PSI and for the abrasive being used?	◯	◯
24. Are air hose connections different from the type used for breathing air supply?	◯	◯
25. Are hoses free from cracks, erosion, soft spots, dry rot, chemical exposures, thermal extremes and other circumstances that may cause deterioration of the hose?	◯	◯
26. Have hoses been located so that they are not causing a tripping or traffic hazard and have means been provided to guard the hose and personnel from exposure?	◯	◯
27. Have hoses, nozzles, deadman switches, dead man lines and solenoids been color coded or numbered to ensure which nozzle each hose feeds?	◯	◯
28. If required, do the blast hose have a current / periodic pressure test?	◯	◯
29. Approved Blast Gloves, Sleeves or Blast suit being worn?	◯	◯
30. Has the facility / client been made aware of hazards associated with the hose and pressurized contents and personnel working in the area of the blast operations been informed of the associated hazards?	◯	◯
31. Has all equipment met the preventive maintenance criteria as required on a routine basis?	◯	◯
32. Has the compressor been located in an area that will not create a hazard from exhaust fumes or contaminated air from being pulled into the air intake of the compressor?	◯	◯

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM A – DAILY INSPECTION FORM – BULK BLASTER / AUTO BLASTER (PAGE 3 OF 3)

33. Have all safety precautions been take to address any hazards associated with the use of breathing air during blast operations (see applicable safety procedures for details)?	◯	◯
34. Have provisions been made to address any toxic hazards created from blasting operations, such as, but not limited to lead exposure including lab results from substrate sample?	◯	◯
35. Are all work surfaces safe to perform work and has adequate access / egress been provided?	◯	◯

Comments	
Inspector Name:	
Inspector's Signature	Date

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM B (PAGE 1 OF 2)

OPERATOR PRE-QUALIFICATION EVALUATION

Equipment/Facility Information:	
Equipment ID #:	Date Evaluated:
Job #:	Facility Location:
Sup/Trainer Name:	Sup/Trainer Signature:
Please Print	*Sign ONLY after operator successfully completes evaluation*

Pre-Qualification Criteria - Must PASS 8 out of 10 without assistance.		
Item to Inspect	**PASS**	**FAIL**
1. Employee properly inspected the bulk blaster and associate hose using the appropriate inspection forms.	○	○
2. Employee demonstrates Steps 1-4 TO FILL the bulk blasting unit, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A). Lock out / Tag out training & Pneumatic closure device.	○	○
3. Employee demonstrates Steps 1-5 TO TURN SYSTEM ON, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A).	○	○
4. Employee demonstrates Steps 1-3 TO BLAST, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A).	○	○
5. Employee demonstrates Steps 1-2 TO BLOW DOWN, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A).	○	○
Numbers 6-8: Describe Trouble Shooting Techniques With Dead-Man in the Off Position		
6. Employee describes Trouble Shooting Technique-A, Air Stops But Machine Won't Shut off Abrasive, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A – Troubleshooting).	○	○
7. Employee describes Trouble Shooting Technique-B, Abrasive Stops But Machine Won't Shut off Air, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A – Troubleshooting).	○	○
8. Employee describes Trouble Shooting Technique-C, Machine Won't Shut off Abrasive or Air, (See Bulk Blaster Operating and Maintenance Instructions, Appendix A – Troubleshooting).	○	○
9. Employee can tell when the Pre-Job Checklist is required.	○	○
10. Employee can describe when the Pre-Start up Checklist is required.	○	○

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM B – OPERATOR PRE-QUALIFICIATION EVALUATION (PAGE 2 OF 2)

Items missed and reviewed with Operator:	
Operator's Name: (please print)	
Operator's Signature:	Date:

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM C (PAGE 1 OF 2)

ABRASIVE BLASTING / BULK BLASTER

OPERATOR ASSESSMENT TEST

Employee / Facility Information	
Employee Name (Please Print):	Date:
Employee SS #:	Job #:
Facility Location:	Test Score:

Test Questions

Minimum 80% require to pass. All missed questions must be reviewed with Trainer/Supervisor.

1. Who shall be involved in developing the JSP?
   a) All employees working on the project
   b) Only the supervisor
   c) The supervisor and the lead-man
   d) Mr. Ed.

2. How often shall the air hose and blast hose be inspected?
   a) Daily
   b) Weekly
   c) Monthly
   d) Once a year

3. Can the blast nozzle be left unattended at any time while it is pressurized? ◯ YES ◯ NO

4. If the top man-way bolts are difficult to loosen, you shall always.
   a) Assume the system is under pressure
   b) Get a larger wrench
   c) Use a hammer wrench
   d) Let maintenance open it

5. How often shall the Pre-Start Up checklist be performed?
   a) Every hour
   b) Before work begins
   c) Weekly
   d) Monthly

6. When shall the blaster be able to communicate with the stand-by operator?
   a) Always, by voice or visual
   b) Each hour
   c) Only at start of shift
   d) Only on Mondays

7. Where can I find information to help trouble shoot the bulk blaster?
   a) Bulk Blaster safety procedure
   b) My Supervisor
   c) The owners manual
   d) All of the above

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM C – ABRASIVE BLASTING / BULK BLASTER OPERATOR ASSESSMENT TEST (PAGE 2 OF 2)

Test Questions (cont.)			
8. Shall the bulk blaster be grounded to reduce static spark while blasting on in-service piping or equipment?			
a)	Yes, and there shall be 1 ohm or less resistance	c)	No, the abrasive will ground by-itself
b)	Yes, but it is not real important	d)	No, only when the foreman requires it
9. According to Brand's procedures, can the Dead-man be altered or chocked to keep from holding the button down?		◯ YES	◯ NO
10. What are hazards associated with abrasive blasting?			
a)	People walking around pressurized hose.	c)	Dust exposure to employees
b)	Exhaust fumes blowing into a confined space	d)	All the above

Signatures	
Trainer or Supervisor Name (please print):	
Trainer or Supervisor Signature:	Date:

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM D (PAGE 1 OF 2)

ABRASIVE BLASTING / BULK BLASTER

TRAIN THE TRAINER EXAM

Employee / Facility Information	
Employee Name (Please Print):	Date:
Employee SS #	Job #
Facility Location:	Test Score:

Test Questions

Must pass with a 90%. All missed questions must be reviewed with Trainer/Supervisor.

1. Who shall be involved in developing the JSP?
   a) All employees working on the project
   b) Only the supervisor
   c) The supervisor and the lead-man
   d) Mr. Ed.

2. How often shall the air hose and blast hose be inspected?
   a) Daily
   b) Weekly
   c) Monthly
   d) Once a year

3. Can the blast nozzle be left unattended at any time while it is pressurized? ◯ YES ◯ NO

4. If the top man-way bolts are difficult to loosen, you shall always.
   a) Assume the system is under pressure
   b) Get a larger wrench
   c) Use a hammer wrench
   d) Let maintenance open it

5. How often shall the Pre-Start Up checklist be performed?
   a) Every hour
   b) Before work begins
   c) Weekly
   d) Monthly

6. When shall the blaster be able to communicate with the stand-by operator?
   a) Always, by voice or visual
   b) Each hour
   c) Only at start of shift
   d) Only on Mondays

7. Where can I find information to help trouble shoot the bulk blaster?
   a) Bulk Blaster safety procedure
   b) My Supervisor
   c) The owners manual
   d) All of the above

ABRASIVE BLASTING SAFE WORK PROCEDURES

FORM D – ABRASIVE BLASTING / BULK BLASTER TRAIN THE TRAINER EXAM (PAGE 2 OF 2)

Test Questions (cont.)	
8. Shall the bulk blaster be grounded to reduce static spark while blasting in-service piping and equipment?	
a) Yes, and there shall be 1 ohm or less resistance	c) No, the abrasive will ground by-itself
b) Yes, but it is not real important	d) No, only when the foreman requires it
9. Can the Dead-man be taped to keep from holding the button down?	◯ YES ◯ NO
10. What are hazards associated with abrasive blasting?	
a) People walking around pressurized hose.	c) Dust exposure to employees
b) Exhaust fumes blowing into a confined space	d) All the above

Signatures	
Trainer or Supervisor Name (please print):	
Trainer or Supervisor Signature:	Date:

